

WHAT IS CLAIMED IS:

1. A method for manufacturing a piezoelectric element comprising a coating step of coating a substrate with a coating liquid for forming the piezoelectric element thereby forming a coated film, a drying step of drying said coated film, a preliminary sintering step of preliminarily sintering said coated film thereby forming an oxide film, a final sintering step of finally sintering said oxide film thereby forming a piezoelectric film, and a cooling step of cooling said piezoelectric film:

wherein said steps are executed in the presence of a moisture-containing gas; in said coating step said substrate has a temperature equal to or less than 50°C and the moisture-containing gas has a relative humidity of 60 %RH or less at 25°C; in said drying step, said substrate has a temperature equal to or less than 200°C and said relative humidity is 10 to 70 %RH; in said preliminary sintering step said substrate has a temperature of 200 to 450°C and said relative humidity is 70 to 100 %RH; in said final sintering step said substrate has a temperature of 500 to 800°C and said relative humidity is 70 to 100 %RH.

25

2. A method for manufacturing a piezoelectric film according to claim 1, wherein the moisture-

containing gas present in said preliminary sintering step, said final sintering step and said cooling step contains oxygen by 10 vol% or more.

5           3. A method for manufacturing a piezoelectric film according to claim 1, wherein said coating liquid includes a raw material component of the piezoelectric film, containing at least one of Pb, La, Zr and Ti as a constituent element.

10

          4. A method for manufacturing a piezoelectric film according to claim 1, wherein said coating liquid includes a raw material component of the piezoelectric film obtained by reacting a metal  
15 alkoxide or a metal salt and water in a solvent having a boiling point equal to or higher than 100°C or in a solvent containing such solvent.

          5. A method for manufacturing a piezoelectric  
20 film according to claim 1, wherein in the cooling step, the relative humidity is 70 to 100 %RH.

          6. A piezoelectric element comprising a piezoelectric film provided between a lower electrode  
25 and an upper electrode, wherein said piezoelectric film is prepared according to the manufacturing method according to claim 1.

7. A piezoelectric element according to claim 6,  
wherein said piezoelectric film is constituted of a  
constituent component represented by a general  
formula  $\text{Pb}_{1-x}\text{La}_x(\text{Zr}_y\text{Ti}_{1-y})\text{O}_3$  (wherein  $0 \leq x < 1$ ,  $0 \leq y$   
5  $\leq 1$ ).

8. An ink jet recording head comprising a  
pressure chamber communicating with an ink discharge  
port, a vibration plate provided corresponding to  
10 said pressure chamber, and a piezoelectric element  
according to claim 7, provided corresponding to said  
vibration plate, wherein an ink in said pressure  
chamber is discharged from said ink discharge port by  
a volume change in said pressure chamber, generated  
15 by said piezoelectric element.